

Inventor: Ronald E. Highsmith
Serial No: 09/855,480
Art Unit: 1724

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Bingham Docket No. 55-003-001

48. (Added) The beneficiated sludge solids composition of Claim 47, having a water content of between about 0 wt.% to about 5 wt.%.
49. (Added) The beneficiated sludge solids composition of Claim 48 in granulated form.

REMARKS

IN THE CLAIMS

There is no new matter added by the claims presented herein – either amended or added. The claims amendments and added claims are presented in response to Paper No. 8, the Interview with Examiner Barry on July 23, 2003 and the voice mail message left with Examiner Barry at (703)306-5921 by Sandra Thompson on the afternoon of July 23, 2003.

Claims 1-11: Amendments are presented based on the Interview with Examiner Barry on July 23, 2003, where it was stated that if the "comprising" language were amended to "consisting essentially of" language that claim 1 would be allowable.

Claims 30-40: Amendments are presented based on Original Specification pages 5-6, where it disclosed and understood that both urea and formaldehyde are undesirable compounds in any process or composition disclosed by the Applicant. Examiner Barry indicated in the Interview that negative limitations may be accepted if supported by the Original Specification, and upon review, the Applicant believes that those limitations are supported.

Claims 40-49: Amendments are presented based on Paper No. 8, specifically the Examiner's statement that original claim 8 is considered allowable if rewritten in independent form. Claim 40 is the amendment of original claim 8 into independent claim 1.

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35 USC §102

Claim 1 is herein rejected under 35 USC §102(b) as being anticipated by O'Donnell (US 3,942,970). The Applicant respectfully disagrees. The Applicant will discuss both the O'Donnell and JP 110570-1997 references individually with respect to anticipation.

Claim 1 recites: "A beneficiated sludge solids composition characterized by its ability to reduce ammonia emissions, the composition consisting essentially of: digested municipal sewage sludge, ammonium sulfate, mineral acid; and phosphate salt." (emphasis added) Proposed Added Claim 30 recites: "A beneficiated sludge solids composition characterized by its ability to reduce ammonia emissions, the composition comprising: digested municipal sewage sludge, ammonium sulfate, mineral acid; and phosphate salt; wherein the composition does not comprise formaldehyde, urea or a combination thereof." (emphasis added) And Proposed Added Claim 41 recites: "A beneficiated sludge solids composition characterized by its ability to reduce ammonia emissions, the composition comprising: digested municipal sewage sludge, ammonium sulfate, mineral acid; and phosphate salt, wherein the salt is selected from the group of trisodium phosphate or sodium tripolyphosphate." (emphasis added)

O'Donnell teaches an apparatus for and a process of treating sludge filter cake and the granular product thereof which comprises reducing the particle size and moisture content of the sludge cake and sterilizing the sludge cake by contacting the sludge cake by contacting the sludge cake with N-methylol-urea solution. (see Abstract) O'Donnell goes on to state in Column 2, lines 25-57 that urea and formaldehyde are reacted to form a pre-polymer N-methylol-urea solution, whereby the solution is then reacted with the sludge as specified by the practice of the invention described therein. O'Donnell states in Column 3, lines 3-29 that a hydrogen ion source is required to convert the HCOH to methylene groups in the polymerization step that involves the urea-formaldehyde pre-polymer. O'Donnell states that either a strong mineral acid or ammonium salts may be added to the pre-polymer to control the introduction of hydrogen ion and for, in the case of the ammonium salts, formation of hexamethylene tetramine. There is no indication from O'Donnell that strong mineral acids and ammonium salts can be combined and introduced into the system described by O'Donnell,

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without the addition of the urea-formaldehyde pre-polymer.

In addition, O'Donnell does not teach all of the claimed elements of the present application. As mentioned earlier, "anticipation requires the disclosure in a single prior art reference of each element of the claim under consideration." *W. L. Gore & Assocs. v. Garlock, Inc.*, 721 F.2d 1540, 220 USPQ 303, 313 (Fed. Cir. 1983) (citing *Soundscriber Corp. v. United States*, 360 F.2d 954, 148 USPQ 298, 301 (Ct. Cl.), *adopted*, 149 USPQ 640 (Ct. Cl. 1966)) Further, the prior art reference must disclose each element of the claimed invention "arranged as in the claim". *Lindermann Maschinenfabrik GmbH v. American Hoist & Derrick Co.*, 730 F.2d 1452, 221 USPQ 481, 485 (Fed. Cir. 1984)(citing *Connell v. Sears, Roebuck & Co.*, 722 F.2d 1542, 220 USPQ 193 (Fed. Cir. 1983)). There is no teaching or suggestion in O'Donnell that a composition can be formed that consists essentially of: a) digested municipal sewage sludge; b) ammonium sulfate; c) mineral acid; and d) phosphate salt or that comprises a) digested municipal sewage sludge; b) ammonium sulfate; c) mineral acid; and d) phosphate salt, wherein the composition does not comprise urea, formaldehyde or a combination thereof or that comprises a) digested municipal sewage sludge; b) ammonium sulfate; c) mineral acid; and d) phosphate salt, wherein the salt is selected from the group of trisodium phosphate or sodium tripolyphosphate. Based on this argument, along with others such as that discussed above, O'Donnell does not anticipate claim 1 of the present application because O'Donnell is lacking and/or missing at least one specific feature or structural recitation found in the present application, and in claim 1. Claim 1 is therefore allowable as not being anticipated by O'Donnell.

JP 110570-1997 discloses an organic fertilizer manufacture method that utilizes treating the sewage sludge with an acidic solution followed by drying to reduce ammonia evolution and to retain the effective nitrogen. There is no indication in JP 110570-1997 that ammonium sulfate or phosphate salt should be added to the acidic solution, because the reference clearly states that controlling the pH by addition of an acidic solution followed by drying are the only method steps and additives needed to treat the sludge described therein. Furthermore, there is no indication from JP 110570-1997 that ammonium sulfate and phosphate salt can be combined and introduced into the acidic system, whereby the acid used causes decomposition of the carbonate or carbon dioxide so that ammonia emissions are minimized.

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In addition, JP 110570-1997 does not teach all of the claimed elements of the present application. As mentioned earlier, "anticipation requires the disclosure in a single prior art reference of each element of the claim under consideration." *W. L. Gore & Assocs. v. Garlock, Inc.*, 721 F.2d 1540, 220 USPQ 303, 313 (Fed. Cir. 1983) (citing *Soundscriber Corp. v. United States*, 360 F.2d 954, 148 USPQ 298, 301 (Ct. Cl.), *adopted*, 149 USPQ 640 (Ct. Cl. 1966)) Further, the prior art reference must disclose each element of the claimed invention "arranged as in the claim". *Lindermann Maschinenfabrik GmbH v. American Hoist & Derrick Co.*, 730 F.2d 1452, 221 USPQ 481, 485 (Fed. Cir. 1984)(citing *Cornell v. Sears, Roebuck & Co.*, 722 F.2d 1542, 220 USPQ 193 (Fed. Cir. 1983)). There is no teaching or suggestion in JP 110570-1997 that a composition can be formed that consists essentially of: a) digested municipal sewage sludge; b) ammonium sulfate; c) mineral acid; and d) phosphate salt or that comprises a) digested municipal sewage sludge; b) ammonium sulfate; c) mineral acid; and d) phosphate salt, wherein the composition does not comprise urea, formaldehyde or a combination thereof or that comprises a) digested municipal sewage sludge; b) ammonium sulfate; c) mineral acid; and d) phosphate salt, wherein the salt is selected from the group of trisodium phosphate or sodium tripolyphosphate. Based on this argument, along with others such as that discussed above, JP 110570-1997 does not anticipate claim 1 of the present application because this reference is lacking and/or missing at least one specific feature or structural recitation found in the present application, and in claim 1. Claim 1 is therefore allowable as not being anticipated by JP 110570-1997.

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35 USC §103

Claim 1 is rejected under 35 USC §103(a) as being unpatentable over O'Donnell in view of JP 110570-1997. The Applicant respectfully disagrees.

Claim 1 recites: "A beneficiated sludge solids composition characterized by its ability to reduce ammonia emissions, the composition consisting essentially of: digested municipal sewage sludge, ammonium sulfate, mineral acid; and phosphate salt." (emphasis added) Proposed Added Claim 30 recites: "A beneficiated sludge solids composition characterized by its ability to reduce ammonia emissions, the composition comprising: digested municipal sewage sludge, ammonium sulfate, mineral acid; and phosphate salt; wherein the composition does not comprise formaldehyde, urea or a combination thereof" (emphasis added) And Proposed Added Claim 41 recites: "A beneficiated sludge solids composition characterized by its ability to reduce ammonia emissions, the composition comprising: digested municipal sewage sludge, ammonium sulfate, mineral acid; and phosphate salt, wherein the salt is selected from the group of trisodium phosphate or sodium tripolyphosphate." (emphasis added)

O'Donnell teaches an apparatus for and a process of treating sludge filter cake and the granular product thereof which comprises reducing the particle size and moisture content of the sludge cake and sterilizing the sludge cake by contacting the sludge cake by contacting the sludge cake with N-methylol-urea solution. (see Abstract) O'Donnell goes on to state in Column 2, lines 25-57 that urea and formaldehyde are reacted to form a pre-polymer N-methylol-urea solution, whereby the solution is then reacted with the sludge as specified by the practice of the invention described therein. O'Donnell states in Column 3, lines 3-29 that a hydrogen ion source is required to convert the HCOH to methylene groups in the polymerization step that involves the urea-formaldehyde pre-polymer. O'Donnell states that either a strong mineral acid or ammonium salts may be added to the pre-polymer to control the introduction of hydrogen ion and for, in the case of the ammonium salts, formation of hexamethylene tetramine. There is no indication from O'Donnell that strong mineral acids and ammonium salts can be combined and introduced into the system described by O'Donnell, without the addition of the urea-formaldehyde pre-polymer.

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JP 110570-1997 discloses an organic fertilizer manufacture method that utilizes treating the sewage sludge with an acidic solution followed by drying to reduce ammonia evolution and to retain the effective nitrogen. There is no indication in JP 110570-1997 that ammonium sulfate or phosphate salt should be added to the acidic solution, because the reference clearly states that controlling the pH by addition of an acidic solution followed by drying is the only thing needed to treat the sludge described therein.

One of ordinary skill in the art of sewage chemistry would not be able to read JP 110570-1997 and O'Donnell and see that they could possibly be combined to give the present application. First, JP 110570-1997 does not suggest that any other additives are necessary past an acidic solution, which the reference describes as sulfuric acid. Second, the O'Donnell reference clearly states that a pre-polymer that is utilized to form a urea-formaldehyde polymer with the sewage sludge is necessary to properly treat the sewage sludge. Ammonium sulfate and mineral acids are only added individually (not in combination with one another) to control hydrogen ion introduction. There is no teaching or suggestion in O'Donnell or JP 110570-1997 that a composition can be formed that consists essentially of: a) digested municipal sewage sludge; b) ammonium sulfate; c) mineral acid; and d) phosphate salt or that comprises a) digested municipal sewage sludge; b) ammonium sulfate; c) mineral acid; and d) phosphate salt, wherein the composition does not comprise urea, formaldehyde or a combination thereof or that comprises a) digested municipal sewage sludge; b) ammonium sulfate; c) mineral acid; and d) phosphate salt, wherein the salt is selected from the group of trisodium phosphate or sodium tripolyphosphate. There is no reason to combine the references mentioned above in this case to produce the claims or details of the present application. Therefore, claim 1 is allowable as being patentable over the combination of O'Donnell and JP 110570-1997, since there is no motivation to combine the references, and second, even if you did combine the references, the combination does not disclose the present application.

The remainder of the references cited by the Examiner, including Rundell (US 3,853,616); Weissenberg (US 6,358,511) and Jacob (US 4,925,571) with respect to independent claim 1 and the remaining dependent claims 2-11, appear to rely on the assumption that the O'Donnell reference precludes patentability of claim 1 of the present application. As shown earlier, the O'Donnell

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reference does not preclude the patentability of the present application because O'Donnell teaches an apparatus for and a process of treating sludge filter cake and the granular product thereof which comprises reducing the particle size and moisture content of the sludge cake and sterilizing the sludge cake by contacting the sludge cake by contacting the sludge cake with N-methylol-urea solution. (see Abstract) O'Donnell goes on to state in Column 2, lines 25-57 that urea and formaldehyde are reacted to form a pre-polymer N-methylol-urea solution, whereby the solution is then reacted with the sludge as specified by the practice of the invention described therein. O'Donnell states in Column 3, lines 3-29 that a hydrogen ion source is required to convert the HCOH to methylene groups in the polymerization step that involves the urea-formaldehyde pre-polymer. O'Donnell states that either a strong mineral acid or ammonium salts may be added to the pre-polymer to control the introduction of hydrogen ion and for, in the case of the ammonium salts, formation of hexamethylene tetramine. There is no indication from O'Donnell that strong mineral acids and ammonium salts can be combined and introduced into the system described by O'Donnell, without the addition of the urea-formaldehyde pre-polymer. Therefore, claim 1 is allowable as being patentable over O'Donnell, and thus, all of the dependent claims are allowable as being patentable over O'Donnell and in addition as being patentable over all of the above-cited references, since they are all cited as against the dependent claims, which contain all of the provisions of independent claim 1.

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REQUEST FOR ALLOWANCE

Claims 1-11 and 30-49 are pending in this application. The applicants request allowance of all pending claims.

Respectfully submitted,
Bingham McCutchen, LLP

Dated: _____

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CURRENT CLAIMS ACCORDING TO REVISED AMENDMENT PRACTICE

1. (Currently Amended) A beneficiated sludge solids composition characterized by its ability to reduce ammonia emissions, the composition comprising consisting essentially of:
digested municipal sewage sludge containing carbonate or carbon dioxide;
ammonium sulfate;
mineral acid; and
phosphate salt;
~~wherein the acid causes decomposition of the carbonate or carbon dioxide so that ammonia emissions are minimized.~~
2. (Original) The beneficiated sludge solids composition of Claim 1, comprising on a water-free basis: about 10 wt.% to about 77 wt.% of said digested municipal sewage sludge; about 21 wt.% to about 88 wt.% of said ammonium sulfate; about 1 wt.% to about 12 wt.% of said mineral acid; and about 0.3 wt.% to about 6 wt.% of said phosphate salt.
3. (Original) The beneficiated sludge solids composition of Claim 1, comprising on a water-free basis: about 25 wt.% to about 75 wt.% of said digested municipal sewage sludge; about 23 wt.% to about 73 wt.% of said ammonium sulfate; about 2.5 wt.% to about 9 wt.% of said mineral acid; and about 0.5 wt.% to about 5 wt.% of said phosphate salt.
4. (Original) The beneficiated sludge solids composition of Claim 1, comprising on a water-free basis: about 35 wt.% to about 70 wt.% of said digested municipal sewage sludge; about 28 wt.% to about 63 wt.% of said ammonium sulfate; about 2.5 wt.% to about 9 wt.% of said mineral acid; and about 0.5 wt.% to about 5 wt.% of said phosphate salt.

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5. (Original) The beneficiated sludge solids composition of Claim 1, wherein the digested municipal sewage sludge is anaerobically digested.
6. (Original) The beneficiated sludge solids composition of Claim 1, wherein the mineral acid is at least one member selected from the group consisting of sulfuric acid and phosphoric acid.
7. (Original) The beneficiated sludge solids composition of Claim 1, wherein the phosphate salt is at least one member selected from the group consisting of ammonium metaphosphate (NH_4PO_3), ammonium monobasic phosphate ($\text{NH}_4\text{H}_2\text{PO}_4$), ammonium dibasic phosphate ($(\text{NH}_4)_2\text{HPO}_4$), ammonium polyphosphate ($(\text{NH}_4)_5\text{P}_3\text{O}_{10}$)), trisodium phosphate (Na_3PO_4), tetrasodium pyrophosphate ($\text{Na}_4\text{P}_2\text{O}_7$), sodium tripolyphosphate ($\text{Na}_5\text{P}_3\text{O}_{10}$), hexasodium hexaphosphate ($\text{Na}_6\text{P}_6\text{O}_{18}$), potassium metaphosphate (KPO_3), potassium pyrophosphate ($\text{K}_4\text{P}_2\text{O}_7$), potassium monobasic phosphate (KH_2PO_4), potassium dibasic phosphate (KHPO_4), potassium tribasic phosphate (K_3PO_4) and calcium superphosphate ($\text{Ca}(\text{H}_2\text{PO}_4)_2$).
8. (Previously Amended) The beneficiated sludge solids composition of Claim 1, wherein the phosphate salt is at least one member selected from the group consisting of trisodium phosphate and sodium tripolyphosphate.
9. (Original) The beneficiated sludge solids composition of Claim 1, having a water content of between about 0 wt.% to about 10 wt.%.
10. (Original) The beneficiated sludge solids composition of Claim 1, having a water content of between about 0 wt.% to about 5 wt.%.
11. (Original) The beneficiated sludge solids composition of Claim 10 in granulated form.

CLAIMS 12 – 29 (WITHDRAWN)

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PROPOSED ADDED CLAIMS

30. (Added) A beneficiated sludge solids composition characterized by its ability to reduce ammonia emissions, the composition comprising:
digested municipal sewage sludge;
ammonium sulfate;
mineral acid; and
phosphate salt;
wherein the composition does not comprise formaldehyde, urea or a combination thereof.
31. (Added) The beneficiated sludge solids composition of Claim 30, comprising on a water-free basis: about 10 wt.% to about 77 wt.% of said digested municipal sewage sludge; about 21 wt.% to about 88 wt.% of said ammonium sulfate; about 1 wt.% to about 12 wt.% of said mineral acid; and about 0.3 wt.% to about 6 wt.% of said phosphate salt.
32. (Added) The beneficiated sludge solids composition of Claim 30, comprising on a water-free basis: about 25 wt.% to about 75 wt.% of said digested municipal sewage sludge; about 23 wt.% to about 73 wt.% of said ammonium sulfate; about 2.5 wt.% to about 9 wt.% of said mineral acid; and about 0.5 wt.% to about 5 wt.% of said phosphate salt.
33. (Added) The beneficiated sludge solids composition of Claim 30, comprising on a water-free basis: about 35 wt.% to about 70 wt.% of said digested municipal sewage sludge; about 28 wt.% to about 63 wt.% of said ammonium sulfate; about 2.5 wt.% to about 9 wt.% of said mineral acid; and about 0.5 wt.% to about 5 wt.% of said phosphate salt.
34. (Added) The beneficiated sludge solids composition of Claim 30, wherein the digested municipal sewage sludge is anaerobically digested.

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35. (Added) The beneficiated sludge solids composition of Claim 30, wherein the mineral acid is at least one member selected from the group consisting of sulfuric acid and phosphoric acid.
36. (Original) The beneficiated sludge solids composition of Claim 30, wherein the phosphate salt is at least one member selected from the group consisting of ammonium metaphosphate (NH_4PO_3), ammonium monobasic phosphate ($\text{NH}_4\text{H}_2\text{PO}_4$), ammonium dibasic phosphate ($(\text{NH}_4)_2\text{HPO}_4$), ammonium polyphosphate ($(\text{NH}_4)_5\text{P}_3\text{O}_{10}$)), trisodium phosphate (Na_3PO_4), tetrasodium pyrophosphate ($\text{Na}_4\text{P}_2\text{O}_7$), sodium tripolyphosphate ($\text{Na}_5\text{P}_3\text{O}_{10}$), hexasodium hexaphosphate ($\text{Na}_6\text{P}_6\text{O}_{18}$), potassium metaphosphate (KPO_3), potassium pyrophosphate ($\text{K}_4\text{P}_2\text{O}_7$), potassium monobasic phosphate (KH_2PO_4), potassium dibasic phosphate (KHPO_4), potassium tribasic phosphate (K_3PO_4) and calcium superphosphate ($\text{Ca}(\text{H}_2\text{PO}_4)_2$).
37. (Added) The beneficiated sludge solids composition of Claim 30, wherein the phosphate salt is at least one member selected from the group consisting of trisodium phosphate and sodium tripolyphosphate.
38. (Added) The beneficiated sludge solids composition of Claim 30, having a water content of between about 0 wt.% to about 10 wt.%.
39. (Added) The beneficiated sludge solids composition of Claim 38, having a water content of between about 0 wt.% to about 5 wt.%.
40. (Added) The beneficiated sludge solids composition of Claim 39 in granulated form.
41. (Added) A beneficiated sludge solids composition characterized by its ability to reduce ammonia emissions, the composition comprising:
 - digested municipal sewage sludge;
 - ammonium sulfate;
 - mineral acid; and

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phosphate salt, wherein the salt is selected from the group of trisodium phosphate or sodium tripolyphosphate.

42. (Added) The beneficiated sludge solids composition of Claim 41, comprising on a water-free basis: about 10 wt.% to about 77 wt.% of said digested municipal sewage sludge; about 21 wt.% to about 88 wt.% of said ammonium sulfate; about 1 wt.% to about 12 wt.% of said mineral acid; and about 0.3 wt.% to about 6 wt.% of said phosphate salt.
43. (Added) The beneficiated sludge solids composition of Claim 41, comprising on a water-free basis: about 25 wt.% to about 75 wt.% of said digested municipal sewage sludge; about 23 wt.% to about 73 wt.% of said ammonium sulfate; about 2.5 wt.% to about 9 wt.% of said mineral acid; and about 0.5 wt.% to about 5 wt.% of said phosphate salt.
44. (Added) The beneficiated sludge solids composition of Claim 41, comprising on a water-free basis: about 35 wt.% to about 70 wt.% of said digested municipal sewage sludge; about 28 wt.% to about 63 wt.% of said ammonium sulfate; about 2.5 wt.% to about 9 wt.% of said mineral acid; and about 0.5 wt.% to about 5 wt.% of said phosphate salt.
45. (Added) The beneficiated sludge solids composition of Claim 41, wherein the digested municipal sewage sludge is anaerobically digested.
46. (Added) The beneficiated sludge solids composition of Claim 41, wherein the mineral acid is at least one member selected from the group consisting of sulfuric acid and phosphoric acid.
47. (Added) The beneficiated sludge solids composition of Claim 41, having a water content of between about 0 wt.% to about 10 wt.%.
48. (Added) The beneficiated sludge solids composition of Claim 47, having a water content of between about 0 wt.% to about 5 wt.%.

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49. (Added) The beneficiated sludge solids composition of Claim 48 in granulated form.